The epidemic of HIV infection in Wisconsin

A review of case surveillance data collected through 2005

Wisconsin AIDS/HIV Program
January 2006

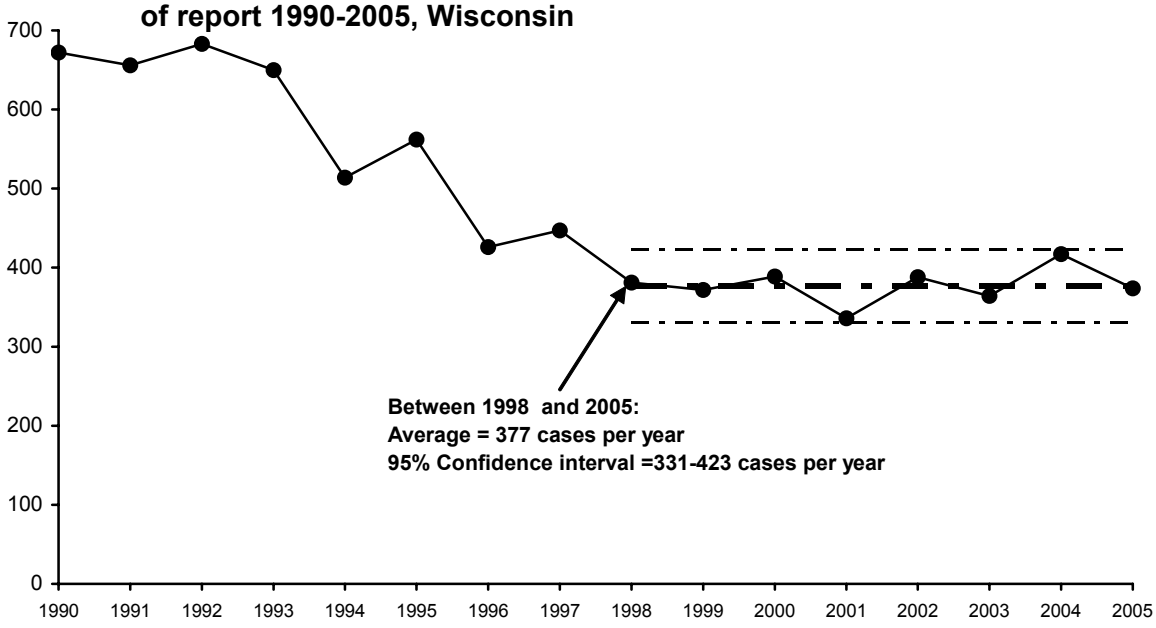
Summary

This report is compiled by the AIDS/HIV Program of the Wisconsin Division of Public Health and presents a summary of HIV case surveillance data collected through the end of 2005. The following are some important findings of this analysis.

- In the year 2005, 374 new cases of HIV infection were reported in Wisconsin, bringing the total number of cases reported since 1983 to 9,116.

- The number of new cases of HIV infection reported in 2005 was 10% less than the 417 cases reported in 2004. Despite this year-to-year variation, this analysis suggests that 2005 was a continuation of a long-term level trend than began in 1998. During this period an average of 377 cases were reported per year (figure).

Figure. Number of persons reported with HIV infection, by year of report 1990-2005, Wisconsin



The epidemiologic profile of cases reported in 2005 reiterates many of the findings from similar analyses in recent years.

- Sexual transmission continues to be the dominant mode of HIV transmission in Wisconsin. Overall, approximately 75%-80% of cases reported in 2005 may be attributed to sexual transmission.

- Sexually transmitted HIV infection has occurred both among heterosexual men and women, and among men who have sex with men (MSM), but MSM have been, and continue to be the population most heavily impacted by HIV infection in Wisconsin. While reported cases among MSM declined during the 1990's, they have tended to increase between 2001 and 2005. In 2005, 60% of newly reported cases were among MSM (including MSM who also report injection drug use).

- Primarily because of the high proportion of HIV infection among MSM, HIV infection in Wisconsin has disproportionately affected men and this finding has continued in recent years. In 2005, 76% of persons reported with HIV infection were male.

- While the median age of cases reported in 2005 was 36 years, most persons were likely infected at younger ages. This is because HIV infected persons often experience a long period during which they appear and feel healthy, and thus remain undiagnosed for years. The CDC estimates that at least one-half of all persons with HIV infection in the U.S. acquired the disease before they were 25 years old.

- HIV infection has occurred among all race/ethnic groups in Wisconsin; however, the race/ethnic disparity continues to be one of its most disturbing features. In 2005 the average annual rate of reported HIV infection was 13-fold greater for African Americans, seven-fold greater for Hispanics, and nearly two-fold greater for American Indians compared to the rate among whites.

- The race/ethnic disparity among females is even greater. In 2005, approximately three-fourths of all females reported with HIV infection were members of race/ethnic minority groups. Compared to white females, African American females had reported rates of HIV infection that were 36-fold greater and Hispanic females had reported rates that were 16-fold greater.

- While HIV cases have been reported from all 72 Wisconsin counties, the distribution of cases has not been even. In 2005, at least one case was reported from 42 counties, but Milwaukee County had nearly one half (48%) of all cases. Five other counties (Brown, Dane, Kenosha, Racine, and Sheboygan) had ten or more cases.

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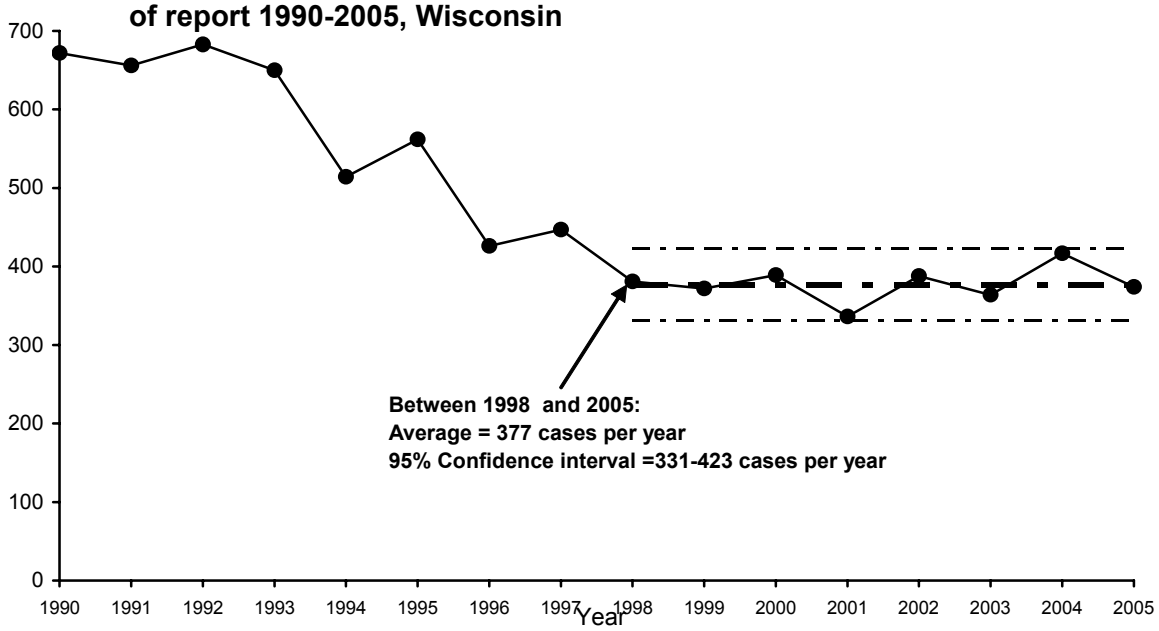
Introduction

In the year 2005, 374 new cases of human immunodeficiency virus (HIV) infection[1] were reported in Wisconsin, bringing the total number of cases reported since 1983 (the year the first cases were reported in Wisconsin) to 9,116. Among all reported cases, 6,140 met the Centers for Disease Control and Prevention (CDC) criteria for acquired immune deficiency syndrome (AIDS); 2,976 persons have been reported with HIV infection but did not meet the AIDS case definition at the end of 2005.

The number of new cases of HIV infection reported in 2005 was 10% less than the 417 new cases reported in 2004. However, a closer look suggests that this difference may represent year-to-year variation of a long-term leveling trend (figure 1). The annual number of reported cases reached a peak between 1990 and 1993 (average: 665 cases) and then declined for five years. Between 1998 and 2005, the number of new cases was relatively constant, averaging 377 (95% confidence interval 331-423) new cases of HIV infection per year.

Figure 1. Number of persons reported with HIV infection, by year of report 1990-2005, Wisconsin



Deaths among persons reported with HIV infection in Wisconsin have also declined from the historic peak (figure 3). Eighty-one deaths among persons reported with HIV infection in Wisconsin are known to have occurred in 2004, bringing total deaths to 3,488.[2] The number of deaths in 2004 was 78% less than the 375 deaths in 1993, the peak year. As a result of declining deaths, the number of persons reported with HIV that are presumed to be alive has continually increased (figure 4). Over the past five years, the increase has averaged 4% per year. At the end of 2005, 5,628 persons reported with HIV infection in Wisconsin were presumed to be alive, an all time high.

[1] In this report, "HIV infection" refers to all persons with laboratory confirmed HIV infection. This includes both AIDS and non-AIDS cases.

[2] Due to delays in reporting of deaths, death data is provisional and an accurate estimate of total deaths in 2005 is not yet available.

Figure 2. Number of deaths among persons reported with HIV infection, by year of death 1990-2004, Wisconsin

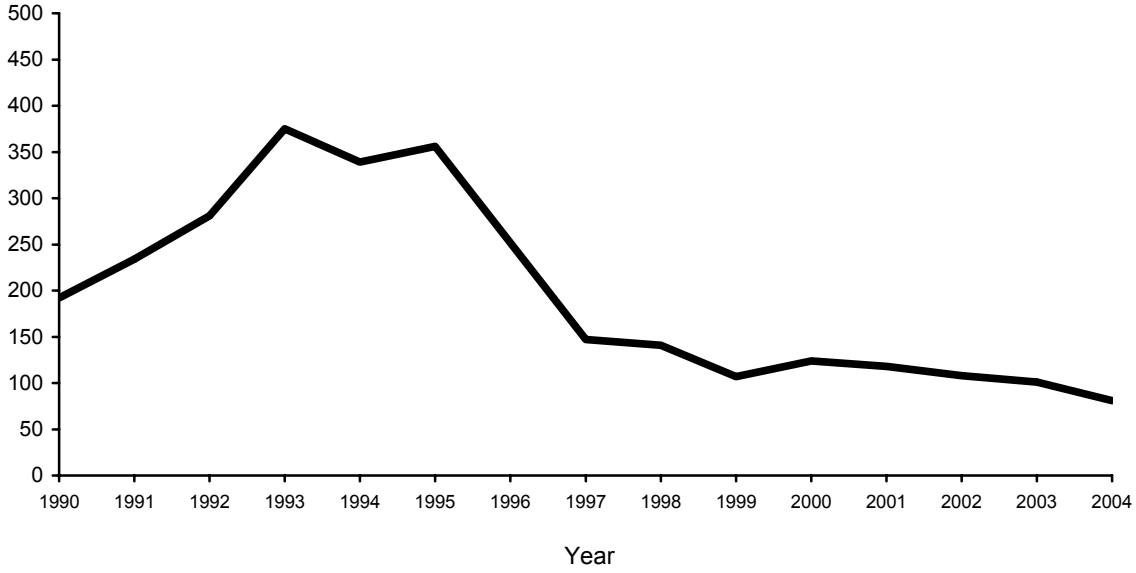
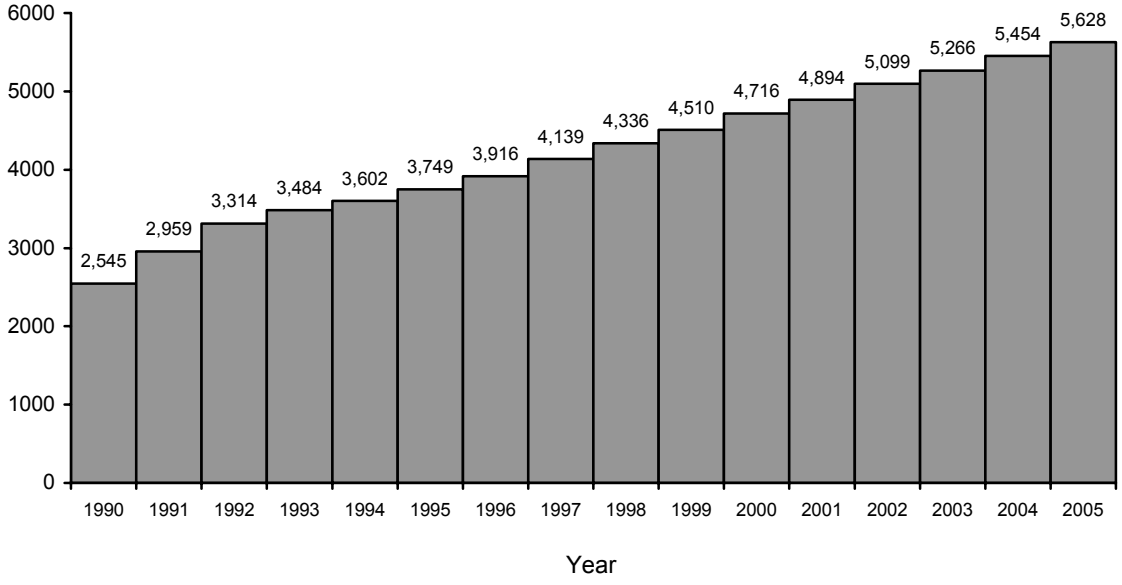


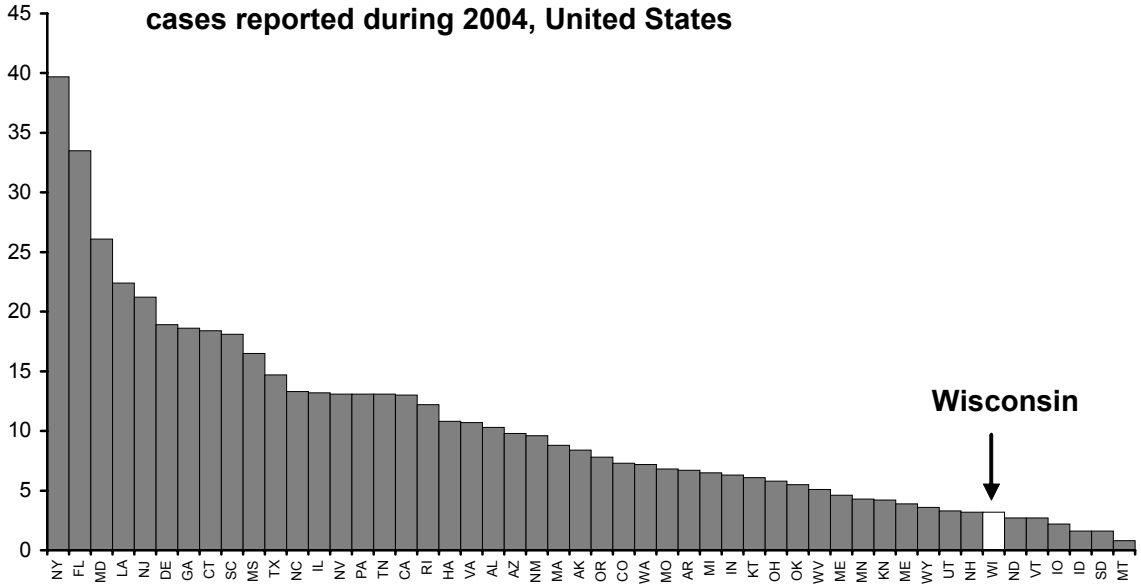
Figure 3. Number of persons reported with HIV infection and presumed alive at years end, Wisconsin, 1990-2005



Wisconsin has historically had a low rate of HIV/AIDS morbidity compared to other states. During the year 2004 (the latest year the national data is currently available), Wisconsin had the seventh lowest AIDS case[3] rate in the United States (figure 4). The highest rate, in New York State; was twelve-fold greater than the rate in Wisconsin.

[3] To compare HIV-related morbidity between states, it is necessary to use AIDS cases because not all states require reporting of non-AIDS HIV infection.

Figure 4. Annual AIDS rates per 100,000 population, by state, cases reported during 2004, United States



Profile of HIV infection in Wisconsin

This section presents a profile of cases reported in 2005 and compares these cases to cases reported in the preceding five year period (2000-2004). The primary focus is on risk-exposure, sex, age at time of diagnosis, race/ethnicity, and geographic residency as important factors in understanding the epidemiology of HIV infection in Wisconsin.

Risk-exposure groups

Table 1 shows the estimated risk-exposure[4] distribution for cases of HIV infection reported in Wisconsin in 2000-2004 and in 2005. In general there were no significant changes in the risk exposure profile during these time periods.

In Wisconsin, HIV infection has always been predominately a sexually transmitted disease. Men who have sex with men (MSM) have consistently been the population most affected by HIV infection in this state. In 2005, an estimated 55% of reported cases were among MSM and an additional 5% was reported among MSM who also reported injection drug use (MSM&IDU). High-risk heterosexual contact was reported by an estimated 20% of cases in 2005. Thus overall, approximately 75%-80% of cases reported in 2005 may be attributed to sexual transmission.

Blood borne transmission, the second most common mode of HIV transmission in Wisconsin, is almost exclusively associated with sharing of injection equipment by injection drug users. In 2005, an estimated 17% of newly reported cases were among non-MSM IDU. Early in the epidemic, HIV transmission occurred among blood transfusion recipients and persons with hemophilia who received contaminated blood products. Since screening of the blood supply began in 1985, HIV transmission among transfusion recipients and persons with hemophilia has

4 . Risk-exposure case numbers in this report are estimates that have been statistically adjusted to allocate cases initially reported without an identified risk factor. Cases were adjusted by sex and race/ethnicity, assuming that cases without identified risk have the same risk-distribution as cases with known risk.

been very rare. In 2005, two persons (<1% of cases) with hemophilia were reported with HIV infection in Wisconsin, and there were no new transfusion-associated cases reported.

Perinatal (mother-to-child) HIV transmission has always been uncommon in Wisconsin and has declined since treatments that reduce the likelihood of perinatal transmission were introduced in the mid-1990s. In 2005, five children born with HIV infection were reported with in Wisconsin, two of these children were born in 2005.

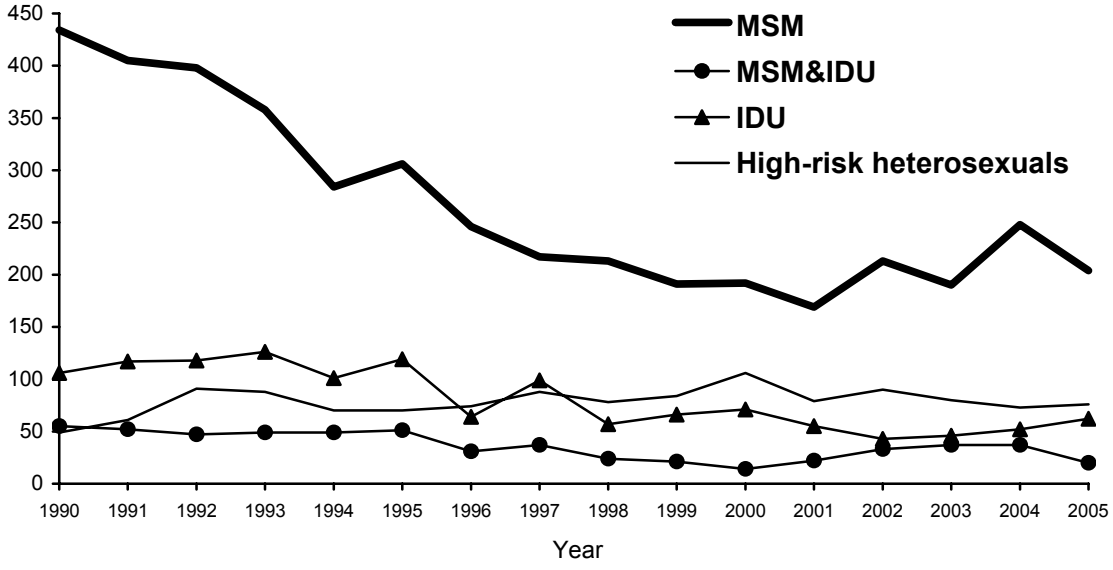
Table 1. Comparison of risk-exposure estimates[1] HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), Wisconsin

	2000-2004			2005	
	Cases	Average[2]	Percent	Cases	Percent
Total	1,894	379	100%	374	100%
Men who have sex with men (MSM)	1,013	203	53%	204	55%
MSM&IDU	143	29	8%	20	5%
Injection drug users (IDU)	266	53	14%	62	17%
High-risk heterosexual contact	428	86	23%	76	20%

1. Risk-exposure case numbers in this report are estimates that have been statistically adjusted to allocate cases initially reported without an identified risk factor. Cases were adjusted by sex and race/ethnicity, assuming that cases without identified risk have the same risk-distribution as cases with known risk.

2. Average number of reported cases per year 2000-2004.

Figure 5. Estimated number of reported cases of HIV infection, by risk-exposure group and year of report 1990-2005, Wisconsin



Among MSM, cases tended to decline throughout the 1990's. More recently cases among MSM have showed signs of an increase, although this trend has been somewhat inconsistent. The estimated number of MSM cases increased from 169 in 2001 to 248 in 2004 then decreased to 204 cases in 2005 (figure 5).

Among other risk-exposure groups, year-to-year variations make trends difficult to discern (figure 5). MSM&IDU cases reached a low of 14 cases in 2000, increased to 37 cases in 2004 before falling to an estimated 20 cases in 2005 (figure 6). The highest number of cases among high-risk heterosexuals was reported in 2000. For the past five years high-risk heterosexual cases have ranged from 73 to 90 cases per year; 76 cases were reported in 2005.

After averaging over 100 cases per year in the early 1990's, new IDU cases reached a low of 43 cases in 2002 followed by an increase to an estimated 62 cases in 2005. A notable finding is that between 2004 and 2005, the estimated number of male IDU cases decreased from 39 to 36 cases, while the estimated number of female IDU cases increased from 12 to 27.

Table 2. Comparison of the demographic characteristics of HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), Wisconsin

	2000-2004				2005		
	Cases	Average[a]	Percent	Rate[b]	Cases	Percent	Rate[c]
Total	1894	379	100%	7.1	374	100%	7.0
Sex							
Male	1473	295	78%	11.1	285	76%	10.8
Female	421	84	22%	3.1	89	24%	3.3
Race/ethnicity							
White	876	175	46%	3.7	171	46%	3.6
African American	732	146	39%	48.1	139	37%	45.7
Hispanic	243	49	13%	25.2	49	13%	25.4
American Indian	17	3	1%	7.2	3	1%	6.4
Asian/Pacific Islander	16	3	1%	3.5	4	1%	4.4
Multi-racial	7	1	0%	-	2	1%	-
Unknown	3	1	0%	-	6	2%	-
Age at diagnosis							
<15 years	25	5	1%	0.4	8	2%	0.7
15-24 years	280	56	15%	7.3	49	13%	6.4
25-44 years	1284	257	68%	16.2	226	60%	14.3
45 years or older	305	61	16%	3.2	91	24%	4.8

a. Average number of reported cases per year 2000-2004.
b. Average annual number of cases of HIV per 100,000 population reported 2000-2004, based on 2000 U.S. Census data.
c. Number of cases of HIV per 100,000 population reported in 2005 based on 2000 U.S. Census data.

Sex

Throughout the epidemic, HIV infection in Wisconsin has disproportionately affected men. This trend has continued in recent years. In 2005, 76% of persons reported with HIV infection were males. This was very similar to the proportion of cases in men reported during 2000-2004 (table 2). In 2005, the reported rate for HIV infection was 3.3-fold greater for males compared to females.

The risk-exposure distribution for males reported with HIV infection in 2005 was similar to that in the previous five years (table 3). For males, 71% of cases were among MSM. An additional 7% were among MSM&IDU. In both time periods, a majority of female cases were among high-risk heterosexuals. However, the percentage of female cases attributed to IDU increased from 21% in 2000-2004 to 30% in 2005 (table 3). This reflects the previously mentioned increase in female IDUs reported in 2005.

Table 3. Comparison of risk-exposure estimates[a] for HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), by sex, Wisconsin

	2000-2004			2005	
	Cases	Average[b]	Percent	Cases	Percent
Males	1473	295	100%	285	100%
Men who have sex with men (MSM)	1013	203	69%	204	71%
MSM&IDU	143	29	10%	20	7%
Injection drug users (IDU)	178	36	12%	36	13%
High-risk heterosexual contact	119	24	8%	20	7%
Females	421	84	100%	89	100%
Injection drug users (IDU)	89	18	21%	27	30%
High-risk heterosexual contact	309	62	74%	56	63%

a. Risk-exposure case numbers in this table have been adjusted to allocate cases initially reported without an identified risk factor. This allocation assumes cases without identified risk have the same risk-distribution as cases with known risk. Other risk-exposure groups account for 2-3% of cases.

b. Average number of reported cases per year 2000-2004.

Figure 6. Reported HIV infection, by year of report and sex, 1990-2005, Wisconsin

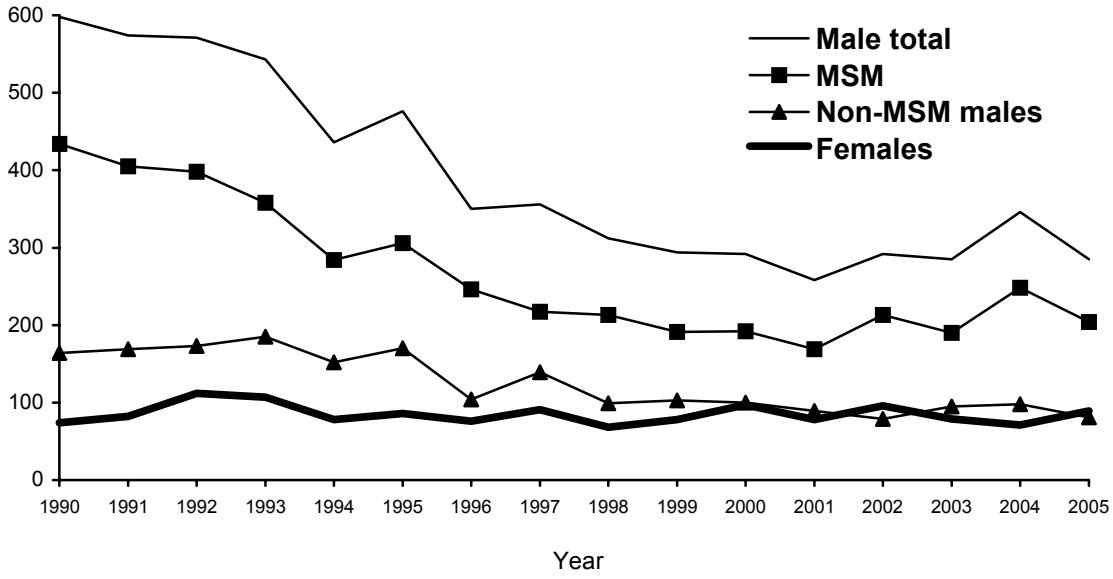


Figure 6 shows the trend in reported cases of HIV infection for males and females. Among females, case numbers have been more-or-less level for a number of years. Between 2000 and 2004, and average of 84 cases per year (range:71-97) were reported among females. In 2005, 89 cases were reported among females.

Among males the recent trend is less clear. In the 1990s there was a definite decline in cases reported among males (figure 6). The number of case reports among males reached a low of 258 cases in 2001, then tended to increase, reaching 346 cases in 2004. In 2005 there were 285 cases of HIV infection reported among males in Wisconsin. This pattern generally parallels the trend in reported cases among MSM that was described earlier. For the past several years, there has been no increase in cases among non-MSM males (figure 6).

Age at time of diagnosis

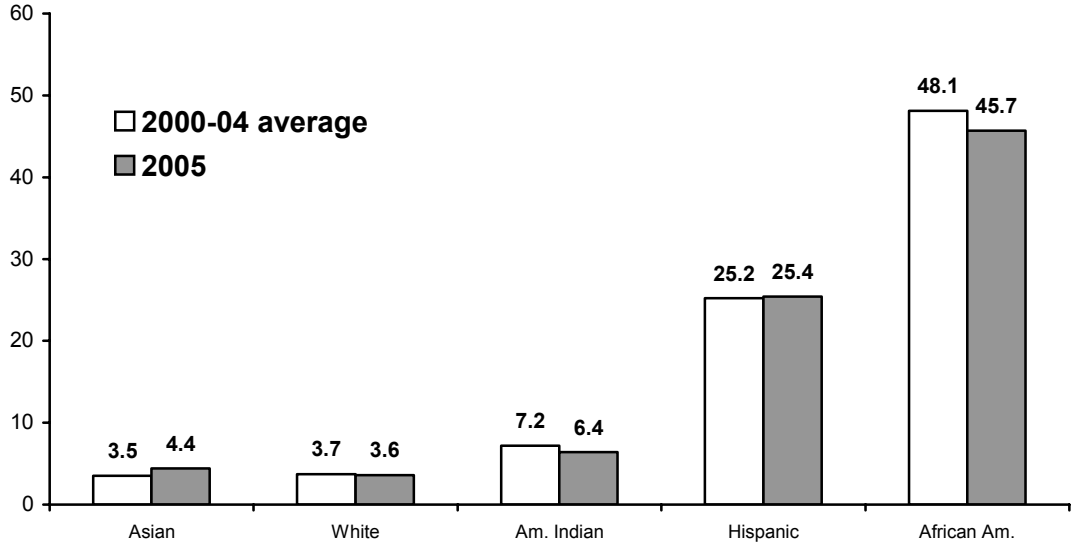
Throughout the epidemic, most persons diagnosed with HIV infection have been between 25 and 44 years of age. In 2005, the median age of cases reported was 36 years (range:0-76 years), compared to 34 years of age (range:0-78 years) in 2000-2004. The older median age in 2005 was a result of an increase in reported cases among persons 45 years of age and older (table 2). Within this age group, the increase was predominately among white men. In 2005, 56 white men 45 years and older were reported, compared to an average of 33 reported cases in 2000-2004. Among white men 45 years and older reported in 2005, 91% with a known risk exposure were MSM.

It is important to note that the age at diagnosis of HIV infection is not usually the age when HIV infection was acquired. Because HIV infected persons often experience a long period during which they appear and feel healthy, they may remain undiagnosed for years. The CDC estimates that at least one-half of all persons with HIV infection in the U.S. acquired the disease before they were 25 years old.

Race/ethnicity

In the 1980s and 1990s, the percentage of reported HIV cases among race/ethnic minorities increased, particularly among African Americans and Hispanics. Since the late 1990s, more than one half of all persons reported with HIV infection in Wisconsin were members of race/ethnic minorities. Between 2000 and 2004 in Wisconsin, 54% of new cases were members of race/ethnic minority groups. In 2005, 50% of reported cases were among race/ethnic minorities (table 2).

Figure 7. Reported HIV infection per 100,000 population, by race/ethnicity for two time periods, Wisconsin



While race/ethnic minorities constitute more than one-half of all persons reported with HIV infection in Wisconsin since 2000, they comprise only about 12% of the Wisconsin population. Because of this, annual rates of reported HIV infection are higher for African Americans, Hispanics, and American Indians than for whites. Between 2000 and 2004 and again in 2005 the average annual rate of reported HIV infection was 13-fold greater for African Americans, seven-fold greater for Hispanics, and nearly two-fold greater for American Indians compared to the rate among whites (figure 7).

Table 4. Comparison of HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), Wisconsin

	2000-2004				2005		
	Cases	Average[a]	Percent	Rate[b]	Cases	Percent	Rate[c]
Male total	1473	295	100%	11.1	285	100%	10.8
White	768	154	52%	6.5	150	53%	6.4
African American	486	97	33%	66.0	88	31%	59.8
Hispanic	186	37	13%	35.6	36	13%	34.4
American Indian	14	3	1%	11.9	1	0%	4.3
Asian/Pacific Islander	12	2	1%	5.3	3	1%	6.7
Multi-racial	5	1	0%		2	1%	
Unknown	2	0	0%		5	2%	
Female total	421	84	100%	3.1	89	100%	3.3
White	108	22	26%	0.9	21	24%	0.9
African American	246	49	58%	31.3	51	57%	32.4
Hispanic	57	11	14%	12.9	13	15%	14.7
American Indian	3	1	1%	2.5	2	2%	8.4
Asian/Pacific Islander	4	1	1%	1.8	1	1%	2.2
Multi-racial	2	0	0%		0	0%	
Unknown	1	0	0%		1	1%	

a. Average number of reported cases per year 2000-2004.
b. Average annual number of cases of HIV per 100,000 population reported 2000-2004 based on 2000 U.S. Census data.
c. Average annual number of cases of HIV per 100,000 population reported in 2005 based on 2000 U.S. Census data.

Table 5. Comparison of risk-exposure estimates[a] for HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), by sex, risk exposure and race/ethnicity, Wisconsin

	White		African American		Hispanic		Other	
	2000-04	2005	2000-04	2005	2000-04	2005	2000-04	2005
Males								
Men who have sex with men (MSM)	78%	88%	61%	52%	54%	57%	54%	57%
MSM&IDU	11%	4%	7%	10%	8%	11%	8%	11%
Injection drug users (IDU)	7%	4%	15%	26%	23%	14%	23%	14%
High-risk heterosexual contact	3%	3%	15%	10%	11%	14%	11%	14%
Females								
Injection drug users (IDU)	18%	33%	25%	29%	15%	38%	0%	0%
High-risk heterosexual contact	74%	56%	71%	67%	77%	50%	100%	100%

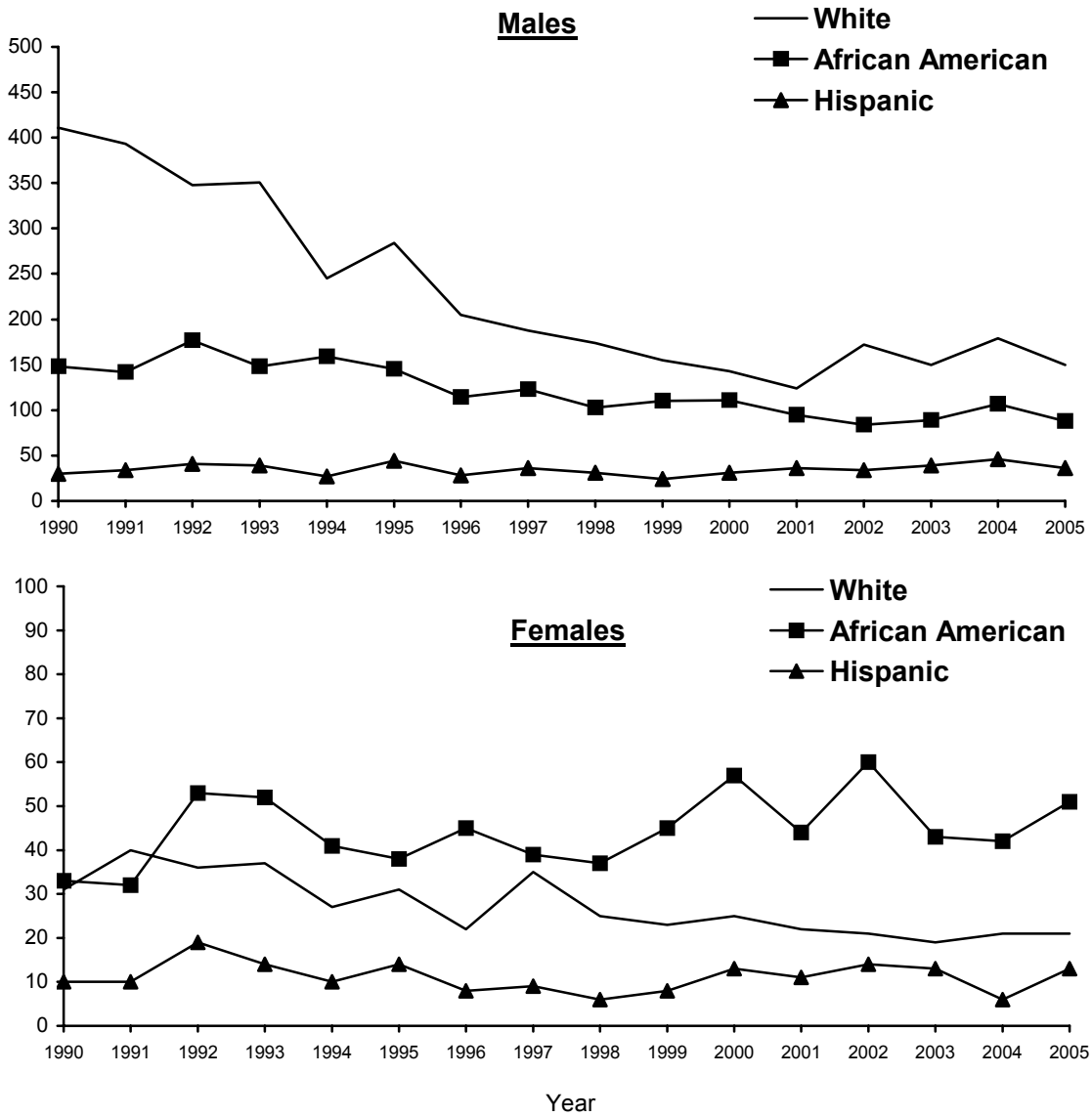
a. Risk-exposure case numbers in this table have been adjusted to allocate cases initially reported without an identified risk factor. This allocation assumes cases without identified risk have the same risk-distribution as cases with known risk. Other risk-exposure groups are not shown.

For males the race/ethnic distribution was similar in 2005 to that seen in 2000-2004 (table 4). During both periods, a majority (52%-53%) of males reported with HIV infection were white. The rate of reported HIV infection was, however, significantly higher among minority males than among white males. African American males had rates 5-6 fold greater than white males. Rates among Hispanic and American Indian males were also higher than among white males. Among

males, MSM is the single largest risk exposure group for all race/ethnic groups (table 5). African American, Hispanic and other race males have higher percentages of IDU and high-risk heterosexual cases than do white males.

The race/ethnic profile for females reported with HIV infection was different than for males. While the race/ethnic distribution was similar during both time periods, approximately three-fourths of all female cases were reported among minorities (table 4). The results is a race/ethnic disparity among females that is considerably greater than among males. African American females had reported rates of HIV infection that were 35-36 fold greater than white females. Reported rates were 14-16 fold greater among Hispanic females compared to white female. For females, high-risk heterosexual contact is the most commonly reported risk-exposure in all race/ethnic groups (table 5).

Figure 8. Reported HIV infection, by year of report, sex, and race/ethnicity, 1990-2005, Wisconsin



For white and African American males, the number of annual reported cases of HIV infection declined during the 1990s (figure 8). Between 2001 and 2005, however, the number of cases among white males has tended to increase slightly, while cases among African American and Hispanic males have remained more-or-less steady.

Over the past ten years, there has been year-to-year variation in annual case numbers among women in all race/ethnic groups (figure 8). Cases among white women have tended to decline slightly since the early 1990s; this has been offset by a very gradual increase among African American women.

Geographic Residency

While HIV cases have been reported from all 72 Wisconsin counties, the distribution of cases has not been even. In 2005, at least one case was reported from 42 (58%) counties, but Milwaukee County had nearly one half (48%) of all cases and only five other counties (Brown, Dane, Kenosha, Racine, and Sheboygan) had ten or more cases.

In 2005, 52% of cases of HIV infection were reported from the four-county Milwaukee MSA[5] (table 6). This percentage was similar to cases reported 2000-2004. The Milwaukee MSA also had the highest rate of reported HIV infection of any metropolitan category. Within the Milwaukee MSA, most cases (91%) were reported from Milwaukee County. The rate of reported HIV infection within Milwaukee County was 6-fold greater than the rate in other Milwaukee MSA counties. Within the Milwaukee MSA, case numbers declined in the 1990s, but have been more-or-less steady for the past five years (figure 9).

In 2005, 39 cases of HIV infection were reported from the Dane County MSA, representing 10% of all cases (table 6). Case numbers were fairly constant in the Dane County MSA in recent years, however in 2005 case totals were lower than in previous years. This was a result of a decrease in reported cases among MSM in Dane County. In 2005, 16 MSM cases were reported from the Dane County MSA compared to 36 cases in 2004.

The HIV case numbers from “other metropolitan” and non-metropolitan counties in 2005 were very similar to the average for the previous five years (table 6). The lowest rates were in non-metropolitan areas. In the “other metropolitan” counties, case numbers have been steady for several years (figure 9). In non-metropolitan counties, case numbers tended to increase between 2001 and 2004 then decreased in 2005. This resulted from a decrease in cases among MSM in non-metropolitan counties from 29 cases in 2004 to 16 in 2005.

[5]In this report, counties are classified into four metropolitan categories. The Milwaukee MSA, population 1.5 million, includes Milwaukee, Ozaukee, Washington and Waukesha counties. The Dane County MSA , population 426,000, includes Dane County. The category “other metropolitan counties” represents a group of fourteen counties (Kenosha, Racine, Rock, Sheboygan, Brown, Outagamie, Winnebago, Calumet, La Crosse, Marathon, Eau Claire, Chippewa, St. Croix, and Douglas) that are part of metropolitan areas as defined by the U.S. Census Bureau. These counties contain medium size cities and together had a population of 1.7 million in the 2000 U.S. Census. The ”non-metropolitan counties” category is comprised of the remaining 53 Wisconsin counties. Non-metropolitan counties are largely rural and had a combined population of 1.8 million in 2000.

Table 6. Comparison of HIV cases reported in 2005 with cases reported in the previous five-year period (2000-2004), by metropolitan category, Wisconsin

	2000-2004				2005		
	Cases	Average[a]	Percent	Rate[b]	Cases	Percent	Rate[c]
Milwaukee MSA	959	192	51%	12.8	195	52%	13.0
Milwaukee County	903	181	48%	19.2	178	48%	18.9
Other Milwaukee MSA Counties	56	11	3%	2.0	17	5%	3.0
Dane County MSA	270	54	14%	12.7	39	10%	9.1
Other Metropolitan Counties	404	81	21%	4.6	85	23%	4.8
Non-Metropolitan Counties	222	44	12%	2.6	46	12%	2.7
Corrections	39	8	2%	-	9	2%	-

a. Average number of reported cases per year 2000-2004.
b. Average annual number of cases of HIV per 100,000 population reported 2000-2004, based on 2000 U.S. Census data.
c. Number of cases of HIV per 100,000 population reported in 2005 based on 2000 U.S. Census data.

Figure 9. Reported HIV infection, by year of report, and metropolitan category, 1990-2005, Wisconsin